

ABSTRACT

A model of a thermal print head is provided that models the thermal response of thermal print head elements to the provision of energy to the print head elements over time. The thermal print head model generates predictions of the temperature of each of the thermal print head elements at the beginning of each print head cycle based on: (1) the current ambient temperature of the thermal print head, (2) the thermal history of the print head, and (3) the energy history of the print head. The amount of energy to provide to each of the print head elements during a print head cycle to produce a spot having the desired density is calculated based on: (1) the desired density to be produced by the print head element during the print head cycle, and (2) the predicted temperature of the print head element at the beginning of the print head cycle.